PREFACE

The purpose of this Environmental Assessment is to provide the basis for evaluation of the environmental impact on the project area due to the routine operation and maintenance of this flood control reservoir. Buffumville Lake has been operated whenever necessary since it was constructed to prevent or reduce downstream flooding. Maintenance and management of the project, including the recreation facilities, during non-flood periods is also of primary importance. Enhancement of the fish and wildlife resources as well as protection of the environment within and around the reservoir area has been given careful consideration.

TABLE OF CONTENTS

BUFFUMVILLE LAKE

I. PROJECT DESCRIPTION

A. INTRODUCTION

1. Location and Authorization

Buffumville Lake is located in south-central Massachusetts in the upper Thames River Basin. This basin terminates at the tidal estuary known as the Thames River and encompasses the eastern third of Connecticut. The Quinebaug sub-basin drains over 50 percent of the Thames Basin and covers predominantly its eastern half. Part of this sub-basin, formed by the French River and the upper Quinebaug, extends into the southeastern corner of Hampden County, Massachusetts.

Buffumville Dam is on Little River 1.3 miles above its confluence with the French River, 2 miles west of the center of Oxford, and about 5 miles north northwest of Webster. Except for a few acres in Oxford, the entire flood encroachment area is in the Town of Charlton, Massachusetts.

The dam, dike and reservoir are elements of the flood protection plan for the Thames River Basin which was approved by the Flood Control Act of August 18, 1941 (Public Law No. 228, 77th Congress, 1st Session). The development and use of reservoirs for public recreational and other purposes is authorized by the Flood Control Act of 1944 (Public Law 534, 78th Congress, 2nd Session), as amended. Buffumville Dam was completed in April 1958, at a cost of $3,068,600.

2. Purpose

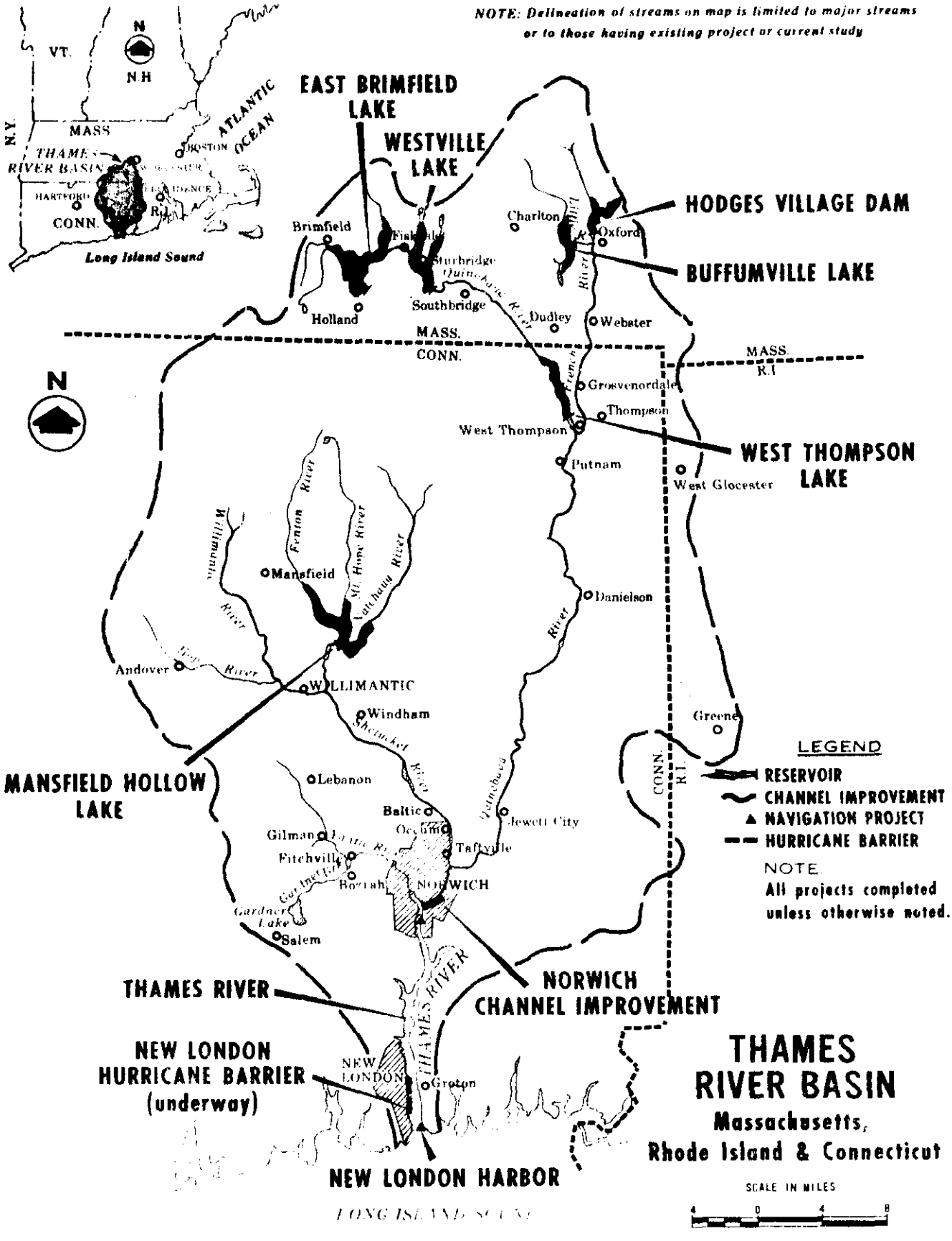
The Corps of Engineers' comprehensive flood control plan for the Thames River Basin consists of six active reservoirs and one local protection project. As part of this program the operation of Buffumville Dam, in coordination with Hodges Village Dam to the east, provides flood protection primarily to Webster, Massachusetts, and also to small towns downstream along the French River to Putnam, Connecticut. The optimum flood control operation is provided by close coordination between the two dams. The project at Buffumville also offers recreational opportunities compatible with the primary function of flood control.

B. STRUCTURES AND RESERVOIR

1. Dam and Appurtenant Structures

Buffumville Dam is a rolled-earth fill embankment with a concrete ogee spillway section 220 feet long with crest elevation at 524 feet above mean sea level (msl). The earth embankment section is 3,225 feet long with a maximum height of 66 feet. The top of the dam at elevation 539 feet msl has a paved access road.

The overflow concrete spillway is joined to the earth dam by concrete nonoverflow gravity walls at each end. It is situated between the north and south abutments. The outlet works in the center of the spillway consist of three gated rectangular conduits, with inverts at elevation 481.5 feet msl. Three electrically operated slide gates control the flow through the outlet works.


NOTE: Delineation of streams on map is limited to major streams or to those having existing project or current study
VT.
N.H
N.Y.
MASS
CONN.
R.I.
ATLANTIC OCEAN
BOSTON
HARTFORD
PROVIDENCE
THAMES RIVER BASIN
Long Island Sound
EAST BRIMFIELD LAKE
WESTVILLE LAKE
HODGES VILLAGE DAM
BUFFUMVILLE LAKE
WEST THOMPSON LAKE
MANSFIELD HOLLOW LAKE
THAMES RIVER
NORWICH CHANNEL IMPROVEMENT
NEW LONDON HURRICANE BARRIER (underway)
NEW LONDON HARBOR
LONG ISLAND SOUND
Brimfield
Holland
Sturbridge
Southbridge
Charlton
Oxford
Dudley
Webster
Grosvenordale
Thompson
West Thompson
Putnam
West Glocester
Danielson
Mansfield
Andover
WILLIMANTIC
Windham
Greene
Lebanon
Baltic
Jewett City
Gilman
Fitchville
Taftville
NORWICH
Gardner Lake
Salem
NEW LONDON
Groton
LEGEND
RESERVOIR
CHANNEL IMPROVEMENT
NAVIGATION PROJECT
HURRICANE BARRIER
NOTE.
All projects completed unless otherwise noted.
THAMES RIVER BASIN
Massachusetts, Rhode Island & Connecticut
SCALE IN MILES
4 0 4 8

The intake channel is excavated in rock and has an average bottom width of about ten feet. The piers between the gate passages are elongated on the upstream side, forming a weir to control the elevation of the permanent recreation pool.

2. Reservoir

Buffumville Dam creates a reservoir at spillway crest elevation (534 feet msl) with a storage capacity of 11,300 acre-feet, which is equivalent to 8.0 inches of runoff from the drainage area of 26.5 square miles. The reservoir, if filled to spillway crest, would have a water surface area of 530 acres and a maximum depth of 43 feet. At this elevation, the reservoir would extend up the Little River approximately 1.7 miles north and 1.9 miles south and would inundate 2 ponds and a reservoir. The recreation pool with a surface area of 200 acres is maintained at elevation 492.5 feet msl.

3. Pierpoint Meadow Pond Dike

A rolled earth fill dike 610 feet long was built in a saddle at the south end of Pierpoint Meadow Pond, 2-3/4 miles from Buffumville Dam. The elevation of the top of the dike is 539 feet msl, the same as for the dam. The main dike and ramp have a paved road along the top.

4. Real Estate

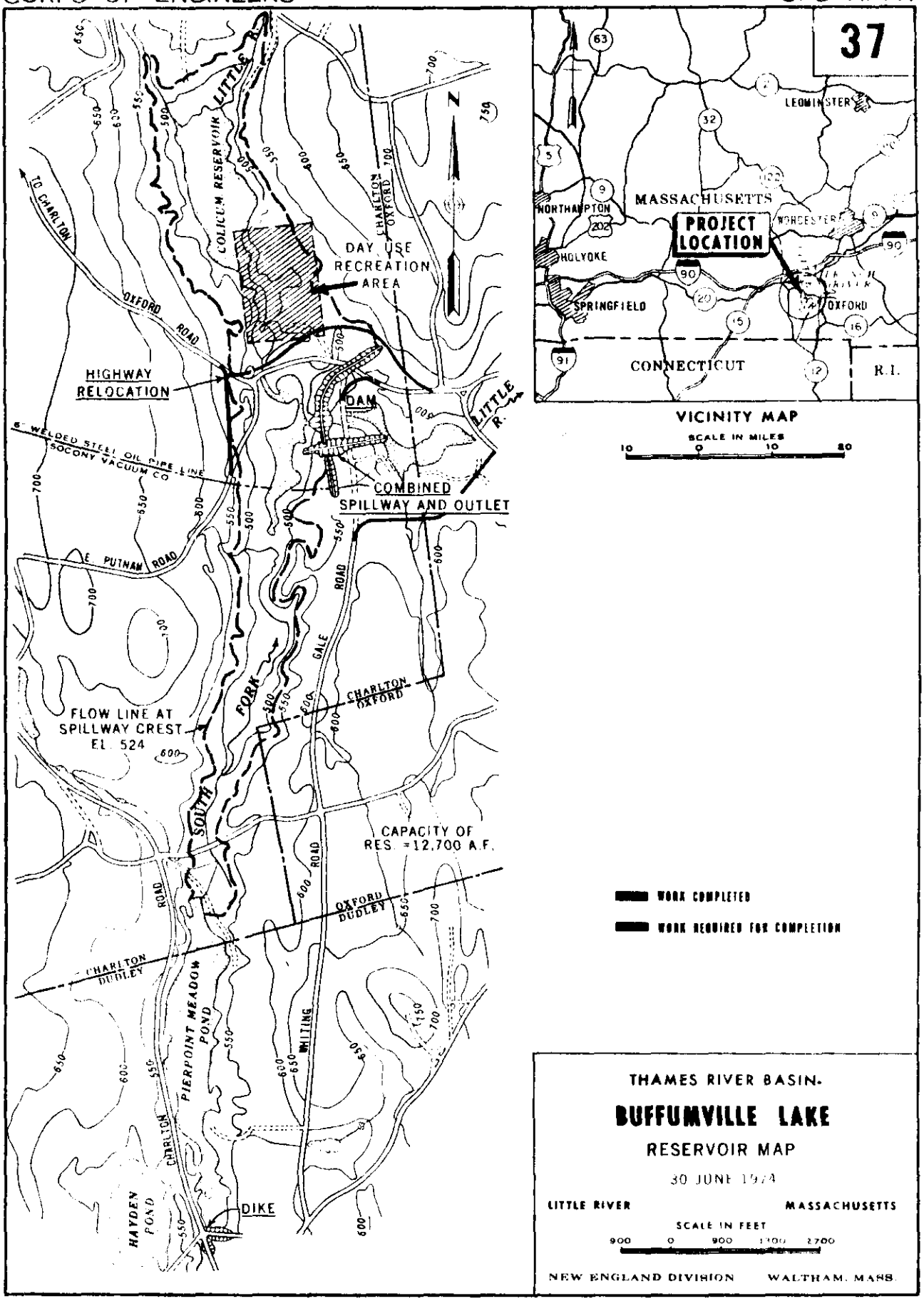
The Buffumville project contains a total of 761 acres, of which 488 have been acquired in fee and 273 in flowage easement. The land taken in fee includes the acreage necessary for permanent

structures and borrow areas and all land below the five-year flood frequency. The easement properties are scattered throughout the flood encroachment area and include all land between elevations 525 and 529 feet (5 feet above the spillway crest). The reservoir area has been cleared to the elevation of the recreation pool, an area of about 200 acres. Over 50 percent of the land acquired is woodland, and the rest consists of approximately equal amounts of farmland, water, and residential properties.

C. OPERATION PROCEDURES

Buffumville and Hodges Village Dams were designed to function as a pair and so are operated together at all times. Coordination of regulation at all six dams in the Thames River Basin provides maximum flood protection. As part of the flood control program in the basin, rainfall reports and snow surveys are made periodically to alert the Reservoir Control Center (RCC) at the Corps' New England Division Headquarters. Reporting networks have been established in cooperation with the National Weather Service, the U.S. Geological Survey, and local authorities. Reports from network stations are received weekly during non-flood periods, and daily during storms, or as often as every three hours during severe storms. Because of rapid runoff in the basin, the emphasis has been on river stage recording stations especially at damage centers downstream of reservoirs, in order to provide prompt information on flood conditions. The operation of the two dams is closely synchronized to provide flood protection to Webster, Oxford and other downstream communities along the French and Quinebaug Rivers.

CORPS OF ENGINEERS U. S. ARMY



II. ENVIRONMENTAL SETTING

A. CLIMATE AND PRECIPITATION

The Thames River Basin, including the Quinebaug sub-basin and Buffumville Lake, has a variable climate characterized by frequent but short periods of heavy precipitation. The basin lies in the path of the "prevailing westerlies" and cyclonic disturbances that cross the country from the west or southwest to the east or northeast. The basin is also occasionally exposed to coastal storms, which usually originate in the mid-Atlantic states and may be of hurricane intensity.

The average annual temperature in the upper Quinebaug sub-basin is about 48°F. The southern part of the watershed has a generally milder climate than the northern part, due to the moderating influence of Long Island Sound. Average monthly temperatures range from about 70°F in July and August to about 27°F in January and February. Air temperatures sometimes reach 100°F in summer and infrequently fall to less than -10°F in winter.

The average annual precipitation over the Thames River Basin is about 44 inches, but it is about two inches less in Webster, Massachusetts, about 5 miles south of the dam. During 64 years of record, snowfall at Worcester, Massachusetts, about 12 miles northeast of Buffumville Dam, has averaged 56.5 inches. However, Putnam, Connecticut, about 14 miles south of the dam, receives about one foot less snowfall on the average. For the Thames River basin as a whole, the average annual runoff is 22.5 inches (1.64 cfs

per square mile), or just over 50 percent of the average annual precipitation.

B. TOPOGRAPHY

The Little River rises northwest of Buffumville Lake in Spencer, Massachusetts, and flows through 6 ponds before reaching the reservoir. It flows into the French River 1.3 miles below Buffumville Dam. The reservoir has a drainage area of 26.5 square miles. During spring freshets, the river rises moderately, and the summer flow is sustained by rainfall and ground water. The Little River has a total fall of 480 feet along a total length of 10.7 miles. In the vicinity of the reservoir the gradient averages around 20 feet per mile.

Hilly terain with moderate relief surrounds the reservoir. The valley of the Little River is largely a ravine interrupted in a few places by broad, flat swampy areas. Elevations in the vicinity of the reservoir range from 481 feet msl in the streambed at the base of Buffumville Dam to about 810 feet msl on Putnam Hill west of the north end of reservoir.

C. SOCIO-ECONOMIC CONDITIONS

The Town of Charlton is still rural, with a large proportion of land in woodland and agriculture, mostly dairy farming. Its largest manufacturing industry is Charlton Woolen Mill. The town's population increased from 3685 in 1960 to 4654 in 1970, but has since stabilized.

Webster is more industrialized, and many people from surrounding communities as well as residents work there. Its industries and population are growing slightly as a result of the new Route 52. The town's population was 12,072 in 1960 and 12,432 in 1970. The major industries and employers in Webster are Anglo Fabrics, B & W Shoe Company, Elegant Yarn and Cranston Print Works. Only a very small fraction of the land in Webster is used for agriculture.

The Town of Dudley, across the French River from Webster, consists mostly of residences of people who work in Southbridge and Webster. Its population has grown considerably because of the prosperity of American Optical Company in Southbridge. In 1960 it was 6510 and in 1970, 8087.

III. ENVIRONMENTAL IMPACT OF THE OPERATION, MAINTENANCE AND MANAGEMENT PROGRAM

A. DOWNSTREAM EFFECTS - REGULATION OF FLOWS AND RELEASES

The flood of record in the Thames River Basin occurred in August 1955. Caused by the torrential rains of Hurricane Diane, it produced damages of an estimated $62 million with 8 lives lost. The Quinebaug sub-basin incurred losses of $37,420,000, of which $32,600,000 occurred in Massachusetts, along with the loss of life. Damages in the French River basin amounted to $15,220,000, much of which centered in Webster.

Upstream of the dam the Little River has a fairly steep gradient, steep valley sides and tributaries conducive to rapid runoff and flooding. Therefore, Buffumville is in a good location to reduce

flood damage to Webster and is a significant benefit to that community and to others downstream on the French and Quinebaug Rivers. In a recurrence of the August 1955 flood, the project would prevent damages of $10,100,000. The total amount of damages that this dam and Hodges Village Dam would prevent is $25,600,000. Since completion, the dam has been responsible for preventing estimated losses of $1,616,000.

Since the dam was built, it has reduced flooding a number of times. The highest stage recorded at Buffumville Lake was 26 feet, or about 23% of capacity. The peak inflow during this flood in December 1965, was about 1000 cfs, and the maximum outflow was about 200 cfs. The lake has been filled to an average of six to ten percent of capacity every year and to about 15 percent in February 1974.

B. PROJECT MANAGEMENT

1. Maintenance Program

The Project Manager is responsible for the routine maintenance of the project area, including clean up of flood debris, trash and litter. The Commonwealth of Massachusetts is responsible for operation and maintenance of Buffumville State Park. Most of the reservoir area consists of unimproved grounds which are not actively managed for recreation or other purposes by the Corps of Engineers and which require only minimum maintenance. The Project Manager fertilizes the grass wherever it is mowed with most of the fertilizer applied to the lawns immediately around the dam. Herbicides are used

to kill weeds on the rock embankments and occasionally highly diluted Simazine is used in spot applications on individual plants. No other weed or brush control is undertaken at this project and no insecticides have been used in recent years.

2. Aquatic Plant Control

Aquatic weed growth, predominantly watermilfoil (Myriophyllum spp.), has become a serious problem, especially along the shoreline and at bething areas. Excessive weed growth is encouraged by the shallowness of the conservation pool, the availability of plant nutrients, and the fertility of the bottom of the conservation pool which was formerly agricultural land.

Prolific growth of undesirable aquatic weeds interferes with water-based recreation activities. Unchecked growth is a nuisance to fishermen, boaters, and swimmers. In addition, watermilfoils are a low-grade duck food at best and provide only marginal benefits as a wildlife food.

Various alternative methods have been tried to control undesirable aquatic weed growth. A chemical treatment with liquid silvex was made at Buffumville Lake in Fall 1972. Undesirable weed growth was checked for a while, but favorable growing conditions require that three annual additional treatments be made, beginning Spring 1976, to insure effectiveness.

Chemical treatment of aquatic weeds has proven to be the only effective means of control. Checking aquatic weed growth will enhance

the quality of the lake for recreation.

Only herbicides which are registered and cleared for aquatic weed control, according to Federal regulations and State laws in effect at the time of the treatment, will be used. Chemical treatments will be conducted by a firm licensed by the Commonwealth of Massachusetts to provide chemical aquatic weed control services. Treatments will be made in accordance with Massachusetts Department of Public Health guidelines.

Chemical treatments to control aquatic weeds at Buffumville Lake are coordinated with the Massachusetts Departments of Environmental Management, Fisheries, Wildlife and Recreational Vehicles and Public Health.

C. VEGETATION

1. Description

About half the land in the Town of Charlton is wooded, including about 80% of the project area above the permanent pool. The woodlands have a closed or mostly closed canopy, with small to medium sized trees, indicating relatively recent regeneration following some previous use, such as agriculture or cutting. The upland woods around Buffumville Lake occur on steep hillsides, and consist predominantly of white pine and red oak with smaller numbers of white oak and shagbark hickory. Hemlock occurs on the steepest ravine sides. The commonly predominating tree of the low woodlands around the lake is red maple. The herbaceous plants of the mowed

areas are grasses, asters, goldenrods and milkweeds. Shrubs found in the project area include silky dogwood, meadowsweet, alder, sweet pepperbush and sumac.

At present there is no active forest management for wood production at the project. However, selective cutting was done in the past on the wooded slopes above the lake. In former borrow and spoil areas the Corps has planted red pine seedlings. A small stand of red pine near the entrance to Camp Wamsutta, a private children's camp adjacent to the lake, has also been planted. The Corps is also considering replacing some of the grass on the steep intake and outlet channel slopes with crown vetch, a legume which would not have to be mowed.

2. Environmental Impact

a. Downstream Effects

The primary objective of flood control operations at Buffumville Dam is to reduce flood stages at Webster, Massachusetts, and other downstream communities. The direct result is a decreased frequency of bank overflow downstream from the dam. The area where these effects occur along the Little River below Buffumville Dam is about half woodland and about three fourths low, flat land which was flooded frequently before construction of the dam. The flood-reducing effects of Buffumville Dam also combine with the effects of Hodges Village Dam. The species composition of the woodland canopy will not change noticeably because the lowland tree species

present can tolerate a range of soil moisture conditions. Changes in the herb, and possibly shrub, species composition may occur in the swamps and marshes. Such changes may also occur in the smaller depressions which normally filled with water during floods and which are now deprived of floods to refill them. In effect, the dams have made the downstream flood plain ecologically narrower. There is less ground surface area now from which floods frequently wash out herbaceous plants and small woody seedlings, leaving bare ground between larger trees and shrubs until late spring or summer.

b. Upstream Effects

The permanent pool behind Buffumville Dam covers 200 acres. the dam has been in operation long enough for a narrow band of wetland shrubs and herbs to become established around the edge of the reservoir. The steep slopes flooded by the permanent pool have prevented the establishment of the typical zones of vegetation around lake and pond edges, from floating to submerged to emergent to terrestrial plants.

Because the reservoir is narrow and steep-sided, floodwaters rise rapidly in it, and small and relatively frequent flood control operations will inundate upland vegetation. However, the stored flood waters also recede rapidly during emptying operations, and the steep slopes drain well. Therefore, flood waters cause only minimal damage in the upland woods, primarily to herbaceous vegetation. In the entire period of operation of Buffumville Dam, flooding has caused almost no tree damage. However, the reservoir has never been filled to more than 23 percent of capacity, and the

longest time that any trees have been inundated is four days. A larger flood and longer inundation period might have more harmful effects on woody plants than have so far occurred.

The effects of flooding on plants depend in part on the season of the flood. Late winter and early spring floods are less likely than summer floods to kill plants by oxygen starvation of the flooded roots, because the plants are dormant until early spring. This may be one reason that flooding has killed so few trees within the project, since the largest flood occurred in December and most others in late winter or early spring.

At present, there is nc active forest management in the reservoir, and a number of conditions make forest management for timber impractical. Most of the woodland is either on steep slopes or on a narrow flat close to the lake shore. Moderate selective cutting, however, will continue and contribute to a wildlife management program.

D. FISH AND WILDLIFE

1. Description

Optimal wildlife habitat at Buffumville Lake is located along the Little River and in the small wetlands areas. Since the vegetation in these places is more diverse, the wildlife using the habitat is correspondingly more diverse. The differences in habitat will delineate various species and their uses of the local environment. For example, the shallow pool is most likely to attract diving ducks and long-necked surface feeders such as Canada geese.

The shallow waters along the outlet of the Little River into the lake attract such surface feeders as black duck, wood duck and mallard. Some wetlands song birds that will also be found in these areas are red-winged blackbird, yellowthroat, and catbird. Fox, muskrat, rabbits and raccoon are among the animals that may be found in the area, along with grouse, pheasant and quail.

Fish species diversity is also dependent on water depth. Chain pickerel and bass are most common in Buffumville Lake with some trout finding their way into the pool from the Little River and Potter Brook which are stocked annually above the reservoir. The Massachusetts Division of Fisheries and Wildlife conducts stocking at the project. Trout are released annually in the reservoir vicinity. In 1974, the Little River received 400 brook trout.

2. Environmental Impact

a. Downstream Effects

When natural flooding is reduced due to reservoir operations, some alteration of aquatic and terrestrial ecosystems will occur downstream. Artificially modified flood patterns below Buffumville Dam have decreased the formerly flooded area, so that there is less aquatic productivity there than before dam construction. Wetlands, even temporary ones, are important to the life cycles and habits of many species of wildlife, waterfowl and fish. They promote insect production and diversity of vegetation which in turn supply food for a variety of fish and birds. Modification of these areas adversely affects the entire food chain of wildlife species from aquatic

invertebrates to spawning fish. The reduced available aquatic and wetland habitat below the dam leads to reduced numbers of aquatic and wetland animals. Downstream of the dam, the area no longer flooded can become terrestrial wildlife habitat if it is not developed.

b. Upstream Effects

To date the Buffumville Lake has had no major detrimental effects on wildlife. However, the effect of flood storage on the area can be significant during the spring and early summer breeding seasons, since, during May and June, birds are rearing young. At this particular time, insectivorous birds are highly dependent on a steady insect population. The wetlands around Buffumville Lake are a major source of insects within the project. Emerging aquatic insects are consumed by many birds as well as mammals, reptiles, amphibians and other insects. Any unnatural change in lake level could affect the breeding success of the lake and wetland ecosystems.

The forms of recreation which affect wildlife are noisy activities, such as water skiing, which extends the length of the lake, and use of trail bikes, even though there are no designated trails for off-road vehicles and the land throughout most of the project area is not conducive to trail development.

E. GEOLOGY AND WATER RESOURCES

1. Description

The bedrock underlying the reservoir is chiefly granitic rocks and phyllites. The Little River flows through a narrow post-glacial valley with occasional broad flats containing ponds and swamps.

Where they occur, the strips of alluvium along the river are narrow. The hilltops and upper hillsides are underlain by till, and the slopes immediately above the lake are in stratified drift with small swamps isolated in pockets. In general, the soil of surrounding land is poor for agriculture. Drainage ranges from good to poor in soil underlain by till and is good in stratified drift. The land around the reservoir, except at the State Park, is too steep for intensive development of recreational facilities. No important mineral deposits have been found in the reservoir area.

The Little River is classified a Class B stream in the reservoir area, however, presently it does not always meet this criteria. Class B waters are suitable for water contact recreation and are acceptable for public water supply with treatment and disinfection. Dissolved oxygen concentrations must not be less than 5 mg/l at any time nor less than 75 percent saturated for more than 16 hours of any 24 hour period. Total coliform bacteria levels must not exceed an average value of 1000 colonies/100 ml nor more than 2400 colonies in 20 percent of the samples during a monthly sampling period.

The New England Division has been collecting periodic water quality samples in Buffumville Lake since 1971. Data from three locations indicate that the mean dissolved oxygen concentration of the inflow through June 1975, is 9.2 mg/l. The mean dissolved oxygen concentration of the discharge waters is 9.9 mg/l. The

policy of drawing water from the bottom of the flood control gates, as well as from the top of the impoundment water surface, aids circulation in the lake and inhibits oxygen depletion. Releases from the surface of the 11 foot deep conservation pool into the discharge conduit serves as a method of aeration to the lake waters being released. This is the reason that the mean discharge concentrations are higher than the inflow concentrations.

The average total coliform bacteria level, from 1971 to 1973, at the bathing beach, based on nine (9) surveys over a thirty six month period, was approximately 1040 colonies/100ml. The State standards were exceeded on one survey during this period. The nine values ranged from 20 to 8000 colonies/100 ml. Periodic bacterial measurements taken of the discharge water indicate that they are within state standards.

Chemical oxygen demand (COD) and total phosphate occasionally are measured in abnormally high concentrations.

The Town of Charlton may eventually operate a well field within the reservoir in the productive stratified drift. The wells are expected to yield a sufficient amount of high quality water for the town's use. The aquifer is rather large and is, therefore, a valuable resource.

2. Environmental Impact

a. Downstream Effects

Recreation pool storage in Buffumville Lake results in slightly increased water temperature of the Little River at the dam

outlet during the summer. The Corps has recently instituted a practice of releasing water from both the bottom and surface of the lake which results in mixing of warmer and cooler water downstream and increase circulation in the lake, as well as reducing the possibility of oxygen depletion in the deeper waters of the lake. The flow of water through the outlet works also provides aeration, which helps to improve its quality.

b. Upstream Effects

Flood control operations affect the quality of water in the reservoir in a number of ways. The annual flooding of Buffumville Lake has the beneficial effect of leaching nutrients from the lake edges. The nutrients are carried into deeper water where aquatic weeds are not likely to become established. In this way, the rate of natural eutrophication is decreased. At the same time, the biological productivity of this lake is low because the lake bottom near the edges is for the most part too steep for near-shore aquatic ecosystems to become established. Flooding also fertilizes the soil by depositing minerals and removing salts.

F. RECREATION

1. Description

The Corps of Engineers oversees the management of all of the reservoir area that is not leased to the Commonwealth of Massachusetts. Buffumville State Park is leased to the Massachusetts Department of Environmental Management for a 25 year period and includes an area of 50 acres.

The State Park recreation facilities include picnic tables, fireplaces, parking area, beach, bathhouse, rest rooms and a boat launching ramp. The Massachusetts Department of Environmental Management is responsible for maintenance, operation and protection. This agency also supervises fishing, hunting, swimming, boating and water-skiing and maintains the access road to its facilities. The recreation area is open to the public from May 15 to September 15. Camp Wamsutta, a private camp is located on the west side of the lake just above the flood encroachment line on the north side of Oxford Road. Campers use the lake for boating and swimming.

Two difficult aspects of managing public land for recreation are preventing abuse and resolving conflicts in use. The facilities for intensive public use at Buffumville Lake are now concentrated in one place - the State Park. This concentration makes it easier to monitor recreational activities. The entire reservoir, except for facilities associated with operation of the dam, is open to the public The only charge is the admission fee to the State Park. The use of the rest of the reservoir is less intensive than at the park. The only restriction to public access is the closing of the project area at night and the State Park in winter.

2. Environmental Impact

Recreational use of Buffumville Lake is necessarily subordinate to authorized flood control operations and occasionally restricted as a result. The boat ramp and beach are subject to annual flooding,

and the sand for the beach must occasionally be replenished. A flood during the summer would interfere with boating and swimming for at least as long as the level of stored floodwaters covered the beach and boat ramp and longer if repairs were necessary. The picnic area is on somewhat higher ground and less likely to be flooded. High water in the spring may interfere with fishing, even though the stocked reach of the Little River and Potter Brook are above the reservoir.

The Corps is responsible for clean up operations throughout the project except at the State Park. Cleanup following a large storm and significant flood storage has, in some cases, required considerable time, during which recreational use may be restricted. Debris and damage to facilities can be rapidly removed or repaired. However, the unsightly conditions of damaged vegetation, mud and silt which sometimes result from flood storage operations cannot be so easily corrected. However, vegetation will usually regenerate naturally and eventually cover flood damaged areas.

Trail bike riding has been a problem also since bike riders often go where they are not allowed. There they have the potential for damage to vegetation and soil and for annoyance to wildlife and other visitors.

Vandalism of picnic facilities and entrance on foot or by vehicle into unauthorized areas are also problems which are unavoidable consequences of public use development.

IV. ALTERNATIVES TO THE OPERATION, MAINTENANCE AND MANAGEMENT PROGRAM

A. DISCONTINUANCE OF AUTHORIZED FLOOD CONTROL OPERATION

If Buffumville Dam ceased operation, there would be no artificial flood storage capacity in the Little River branch of the Quinebaug River sub-basin, although there are ponds, swamps and mill dams. Large floods would severely jeopardize the Town of Webster and other downstream developments in the flood plain. Discontinuance of flood control is not economically sensible and would rot be unless all development in the downstream flood prone areas were removed and future development prohibited. Since many communities, however, depend in various ways on proximity to the river for their economic stability, the need for the flood control dam will continue due to the ever present possibility of large floods.

B. LAND MANAGEMENT ALTERNATIVES

1. Single Purpose Versus Multiple Use Management

The Corps of Engineers' policy in managing its reservoirs is to allow for optimum public use consistent with flood control objectives. However, the various types of management programs suitable for a given project depend in part on such factors as: geographic location; topography; frequency, duration and extent of reservoir flooding; supply of and demand for various forms of land and water oriented recreation; and compatibility of different land and water uses with one another. These physical constraints will determine the suitability of an area for one use alone or for many coexisting uses which can be managed simultaneously.

Multiple purpose resource management has come to be accepted by all public agencies as a necessary response to the need for obtaining optimum use of public land. In view of the economic desirability of flood control, single-purpose management for any other purpose is not considered feasible. However, Buffumville Lake does have natural resource and recreational values which would be wasted if the project was managed solely for flood control.

2. Conservation and Recreation

As the human population of south central Massachusetts grows, the demand for land and its various uses will increase. It is important to the residents of this area that the land be used wisely.

The recreational activities now accommodated at Buffumville Lake are quite compatible with flood control. The swimming, boating, fishing and picnicking provided at the State Park and the activities at Camp Wamsutta do not conflict with one another.

The public's recreational demand and the natural resources of Buffumville Lake are the primary reasons for continuing multiple, rather than single-purpose use of this project. Because this land must be left undeveloped for flood storage, it is preserved from potential diversion to more profitable uses. Since it is being managed as natural open space, its use for conservation and recreation is compatible with flood control objectives.

3. Aquatic Plant Control

Alternatives to the chemical treatment of aquatic plants include mechanical treatment and reservoir drawdown and exposure. Mechanical

control is expensive, and the disposal of harvested aquatic vegetation is a problem. Also, mechanical methods provide only temporary, short-term control. Reservoir drawdown and exposure has been tried before at another reservoir with little success. The pool was lowered in the fall and raised in the spring. Drawdowns during periods of active weed growth are not possible because of the impact on seasonal recreation activities.

Chemical treatment of undesirable aquatic weeds is needed to prevent degradation of the lake caused by unchecked growth. Maintenance and enhancement of the lake's long-term productivity will not be influenced by the chemical treatment.

C. OPERATION AND MAINTENANCE ALTERNATIVES - RECREATION

Section 4 of the 1944 Flood Control Act (Public Law 534, 78th Congress) authorized the construction, maintenance, and operation of public park and recreational facilities at flood control reservoirs. Since that time part of the Corps' responsibility has been to make provisions for various recreational uses compatible with primary flood control objectives. The large numbers of visitors to the project (about 70,000 annually) indicates that the recreational opportunities offered are popular and needed. Therefore, the discontinuance of operation and maintenance of the recreational facilities would deprive users of recreational opportunities and probably create greater pressure and, perhaps, environmental stress on other public lands.

Leaving the rest of the Buffumville project undisturbed for the benefit of wildlife and plants would maintain the present

balance on the property between undeveloped open space and relatively high intensity recreation, thus responding to the necessity for both. This course of action is also prudent, because most of the undeveloped land is topographically unsuitable for man-made facilities.

V. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

A. INTRODUCTION

Most flood control projects have been developed in response to an immediately perceived need to protect valuable land uses from harmful flooding. Usually the response has occurred after some critically damaging flood. In these cases, hindsight tells us exactly where flood control is necessary and to what extent.

B. SOCIO-ECONOMIC EFFECTS

Communities along the French River experienced severe damages in the major flood of August, 1955. At that time, the Mansfield Hollow Dam on the Natchaug River at Mansfield Hollow, Connecticut, was the only Corps of Engineers flood control project in operation in the Thames River basin. Within ten years of the flood, the other five reservoirs in the Thames River basin comprehensive flood control system were constructed and operating. The rapid development of the reservoir network was based on the newly perceived need for flood protection.

The 1955 flood caused damages of an estimated $62 million, with eight lives lost. The French River and the upper reaches of the Quinebaug River together accounted for almost 60 percent of the total loss in the Thames River Basin. About $15,220,000 worth of damage

occurred in the French River sub-basin. In Webster, Massachusetts, flooding caused severe damage to industries, business and homes One dwelling and two businesses were destroyed, and the four major industries in town lost stock and equipment. The gas and electric company was put temporarily out of operation and later abandoned because of the high cost of repairing damage. The flood also damaged the sewage treatment plant so severely that a new one eventually had to be built. Damage to businesses and industries is particularly costly because, in addition to direct losses from flooding, jobs are lost or suspended, and the whole economy of the affected community suffers. The period of reconstruction creates hardships for families of the jobless, as well as for people who provide services to them.

The Town of Webster has industrial and commercial enterprises and residences in the French River flood plain. This past development eliminated natural flood storage areas, reduced the river's hydraulic efficiency, and resulted in construction directly in the path of floods. Yet such development has been economically beneficial to the town. Therefore, the flood protection offered by Buffumville Dam may contribute to the town's continued economic stability and the region's long-term economic productivity.

The dams in the Thames River Basin were designed to protect development already in the flood plain and not necessarily new construction. Unfortunately, communities below Buffumville Dam have made few plans to limit further flood-plain development or otherwise regulate flood-plain use. In fact, flood protection has often encouraged increased construction and development in the flood plain.

Methods of long-term environmental planning are being developed to deal with the above problems.

C. BIOLOGICAL COMMUNITIES AND ECOSYSTEMS

The upstream effect of Buffumville Dam on biological productivity has been a reduction, because the lake shores are for the most part too steep to support near-shore aquatic ecosystems. A low productivity aquatic ecosystem has replaced the former terrestrial ecosystem. Downstream land use regulations restricting flood plain development could help to maintain and, perhaps also restore, the biological productivity and ecological diversity which have been forfeited for the unrestricted economic development of flood-prone lowlands. The Commonwealth of Massachusetts' Hatch Act is a constructive step in this direction.

VI. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH ARE INVOLVED IN THE OPERATION AND MAINTENANCE PROGRAM

Besides the 200 acres of vegetation removed or drowned due to the permanent pool, and land used for borrow areas and dam construction, there has been little damage to vegetation from flooding. Vegetation at higher elevations may be damaged or killed during or after storage operations for a large flood. Frequent flooding has caused changes in the plant species composition of the narrow lake shore. Approximately 100 acres surrounding the pool will remain in a state of continual recovery from the effects of annual flooding at Buffumville Lake.

Wildlife within the reservoir area also may suffer from flood control operations. At the time of construction, most of the 761-acre Buffumville project was farmland, woodland or meadow and supported a variety of terrestrial animal species. Along with the loss of terrestrial habitat in the permanent pool at Buffumville Lake, there are occasionally some direct losses from drowning due to flood control operations.

Large floods disrupt and disperse fish populations, their spawning, and their food sources. The general instability of the environment for a stream fishery in the most frequently flooded parts of the river and streams above the lake constitutes an irreversible compromise of the quality of that resource, along with a degree of irreparable loss.

VII. COORDINATION WITH OTHER AGENCIES

Coordination with various State and local interests resulted in valuable input to this assessment. Meetings and correspondence as well as reports, suggestions, and research data proved to be very helpful. The following is a list of the several interests with whom coordination took place:

Massachusetts Department of Environmental Management
Division of Parks and Recreation

Massachusetts Department of Fisheries, Wildlife and Recreation Vehicles

Town of Webster

U.S. Department of the Interior
Bureau of Outdoor Recreation
Geological Survey

Upon evaluating the material presented in this Environmental Assessment, it is my belief that continued operation, maintenance and management of the Buffumville Lake flood control project is in the best public interest. To discontinue operation of this project could cause serious flooding downstream of the dam with significant property damage. Public recreation opportunities provided at the project would also be lost if management of the area ceased.

Environmentally, the operation, maintenance and management of Buffumville Lake has only a minor impact. The downstream aquatic and terrestrial ecosystems have been altered somewhat due to reduced natural flooding. Impoundment of flood waters in the reservoir has minimal effects of fish reproduction, wildlife habitat and vegetation since the duration of inundation is usually rather short and often at non-critical times of year.

Therefore, since the environmental impacts of continued operation, maintenance and management of the Buffumville Lake Flood Control Reservoir are minor, a formal environmental statement is not required under the provisions of the National Environmental Policy Act of 1969.

Is is my opinion that the public will best be served by continuing operation of Buffumville Lake.

12 April 1976
(date)

JOHN H. MASON
Colonel, Corps of Engineers
Division Engineer